

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-9 and 18-33, drawn to the alpha and beta fractions of naphthenic acid.

Group II, claim(s) 10-17, drawn to an apparatus.

Group III, claim(s) 33 (second instance), drawn to an iron chelator.

2. The groups of inventions listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

3. The special technical feature of Group I is the distinction of the alpha and beta fractions of naphthenic acid. The special technical feature of Group II is the apparatus. The special technical feature of Group III is the iron chelator.

4. During a telephone conversation with Martin Fessenmaier on 13 April 2010 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-9 and 18-33. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-17 and 33 (second instance) are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

DETAILED ACTION

Claim Objections

6. Claims 1-4 are objected to because of the following informalities: It must be indicated that these are compositions. Appropriate correction is required.
7. Claim 28 is objected to because of the following informalities: Examiner suggests changing "a naphthenic acids" to either - a naphthenic acid- or - naphthenic acids- -. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
9. Claims 18 and 26-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. Claim 18 does not particularly relate the determination step with the combination step, and what is to result. The metes and bounds of this claim is therefore unclear. This is better defined in claim 20.

11. Claims 26-28 are drawn to increasing the total acid number to reduce the naphthenic acid corrosivity, however increasing the total acid number would increase the corrosivity.

Claim Rejections - 35 USC § 102/ 35 USC § 103

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1-9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Petersen (US 5,182,013).

15. For the purposes of examination, Claims 1- 9 are being treated as a composition.

16. Regarding claims 1-2, 5 and 9, Petersen teaches a process of reducing naphthenic acid corrosivity by blending oil that has a higher fraction of naphthenic acid content with oil that has a lower fraction of naphthenic acid content (column 1, lines 25-26).

17. Regarding claim 3, Petersen teaches the limitations of claim 1, as discussed above. While Petersen does not explicitly teach the total acid number of each stream, Petersen teaches that the amount of naphthenic acid contributes to the corrosivity of crudes (column 1, lines 17-20). Also, more corrosive crudes possess higher total acid numbers (column 2, lines 26-30). The higher naphthenic acid content crude would have a higher total acid number than the lower naphthenic acid content crude. Therefore, it would have been obvious to the person having ordinary skill in the art to have used the Petersen method to blend a higher naphthenic acid content crude with a total acid number such as 2.0, with a lower naphthenic acid content crude with a total acid number of 0.3, for the benefit of reducing the naphthenic acid corrosivity of the higher naphthenic acid content crude.

18. Regarding claim 7, Petersen does not explicitly teach the total acid number of the resulting product. However, since Petersen teaches a general reduction of corrosivity, as discussed above, the person having ordinary skill in the art would readily recognize that the resulting Petersen process would be able to produce a composition with a total acid number of at least 2.5.

19. Regarding claim 8, Petersen does not explicitly teach the mole percent of naphthenic acid or the average molecular weight. However, in this regard, the Petersen process does reduce the naphthenic acid content. Additionally, it is well known that naphthenic acids generally have molecular weights between 200-700.

20. Thus, Examiner holds that the Petersen process, would result in the same product as in claims 1-3, 5 and 7-9.

21. In this regard, it is noted that "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CC PA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

22. Regarding claims 4 and 6, Petersen teaches the limitations of claims 1 and 5, as discussed above.

23. Petersen does not explicitly teach obtaining one of the naphthenic acid containing oil streams is prepared from a refinery crude using thermal hydroprocessing.

24. However, it is noted that these claims are product-by-process claims. The Petersen reference teaches process steps which would result in the same product, as discussed with respect to claims 1-3, 5 and 7-9 above.

25. In this regard, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

26. Thus, Examiner holds claims 4 and 6 unpatentable in view of Petersen.

Claim Rejections - 35 USC § 102

27. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

28. Claims 18-21, 26-27, 29 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Petersen (US 5,182,013).

29. Regarding claims 18-21 and 29, Petersen teaches that naphthenic acid constituents in crude oils cause severe corrosion problems in petroleum refining operations (column 1, lines 13-15). One way to reduce the naphthenic acid corrosion is to blend oil that has a higher fraction of naphthenic acid content with oil that has a lower fraction of naphthenic acid content (column 1, lines 25-26).

30. Regarding claims 26-27, Petersen teaches blending oil that has a higher fraction of naphthenic acid content with oil that has a lower fraction of naphthenic acid content (column 1, lines 25-26) to reduce corrosivity, as applied to claims 18-21 and 29 above. Petersen additionally teaches that crude oils with acid numbers of about 1.0 and below are low to moderately corrosive; and crude oils with acid numbers greater than 1.5 are considered corrosive and require treatment (column 2, lines 26-30). Thus, by the Petersen blending of oils to reduce corrosivity, the total acid number is also decreased.

31. Regarding claims 32 and 33, Petersen teaches that the higher fraction of naphthenic acid content oil is more corrosive, and should be blended with the lower fraction of naphthenic acid content oil which is less corrosive, in order to reduce the corrosivity of the oil (column 1, lines 13-26).

Claim Rejections - 35 USC § 103

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

33. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

34. Claims 22, 28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petersen (US 5,182,013).

35. Regarding claim 22, Petersen teaches the limitations of claim 20, as discussed above.

36. Petersen does not explicitly teach the specific source of the crude oil.

37. However, it would have been obvious to the person having ordinary skill in the art to acquire a refinery feedstock with a certain naphthenic acid corrosivity from Athabasca oil sand crudes, since this is a well known source of oil sand.

38. Regarding claim 28, Petersen teaches that the amount of naphthenic acid present in a crude contributes to the corrosivity (column 1, lines 17-20). More corrosive crude oils have higher acid numbers (column 2, lines 25-30).

39. In view of this teaching, it would have been obvious to one of ordinary skill in the art that by blending a crude feedstock having a lower concentration of naphthenic acid with a naphthenic acid stream (which would have a much higher naphthenic acid content) would result in a stream which has a higher total acid number than the original crude stream.

40. While Petersen does not explicitly teach the molecular weight of the naphthenic acid, it is well known in the art that naphthenic acids generally have molecular weights in a range between 200-700, which reads on the claimed average molecular weight of at least 350.

41. Thus examiner holds claim 28 unpatentable, in view of Petersen.

42. Regarding claim 31, Petersen teaches the limitations of claim 29, as discussed above.

43. Petersen does not explicitly teach the specific source of the crude oil.

44. However, the person having ordinary skill in the art would readily recognize that opportunity crudes would be a suitable resource to apply to the Petersen process.

45. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman (US 1,986,775) in further view of Petersen (US 5,182,013) .

46. Regarding claims 23-25, Kaufman teaches distilling crudes to produce a lubricating oil fraction containing a substantial fraction of naphthenic acids, and then subjecting to further vacuum distillation to produce lubricating oils substantially free from naphthenic acids and a residual fraction containing organic acid in the form a of non-volatile salts (column 1, lines 40-48).

47. Kaufman does not explicitly teach combining the lubricating oil substantially free from naphthenic acid (extremely low fraction of naphthenic acid content oil) with the original feedstock.

48. However, in the analogous art of reducing naphthenic acid corrosion, Petersen teaches that one way to reduce the naphthenic acid corrosion is to blend oil that has a higher fraction of naphthenic acid content with oil that has a lower fraction of naphthenic acid content (column 1, lines 25-26).

49. Therefore, the person having ordinary skill in the art would have been motivated to have blended the Kaufman lubricating oil substantially free from naphthenic acid with the original crude fraction (having a higher fraction of naphthenic acid content), for the benefit of reducing the corrosivity of the crude.

50. Additionally, the person having ordinary skill in the art would readily recognize that this modification would be appropriately carried out through using a recycle loop to blend the lubricating oil with the crude.

51. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Petersen (US 5,182,013) in further view of Blum (US 5,820,750).
52. Petersen teaches the limitations of claim 29, as discussed above. Petersen does not explicitly teach the processing of the oils to comprise a step of hydrothermal processing.
53. However, in the analogous art of naphthenic acid corrosion, Blum teaches subjecting feeds containing acids to thermal treatment to decompose the acids and obtain a feed with a significantly reduced total acid number (column 1, lines 56-60).
54. Since Petersen teaches blending streams of lower naphthenic acid content with streams having higher naphthenic acid content, the person having ordinary skill in the art would have been motivated to have used the Blum thermal treatment process to produce a stream low in naphthenic acid content to blend with another stream having higher naphthenic acid content.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle L. Stein whose telephone number is (571)270-1680. The examiner can normally be reached on Monday-Friday 8:30AM-5PM EST, Alt Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571)272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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